PURGE SOLUTIONS®

Differential Pressure Gauge Kits

User's Manual

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Patent Notice:

Manufactured under United States, Worldwide Patents, and Patents Pending.

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Section 1
How to Use This Manual

Safety Considerations:

This chapter includes important information that must be read and understood by all persons installing, using, or maintaining this equipment. While this manual is designed to aid personnel in the correct and safe installation, operation, and maintenance of the systems described. Personnel must consider all actions and procedures for potential hazards or conditions that may not have been anticipated in the written procedures. If a procedure cannot be performed safely, it must not be performed until appropriate actions can be taken to ensure the safety of equipment and personnel. The procedures in this manual are not designed to replace or supersede required or common sense safety practices. All safety warnings listed in any documents applicable to equipment and parts used in or with the system described in this manual must be read and heeded before commencing work on any part of the system.

NOTE: ***Refer to all ATEX, CSA, IECEx, NEC, NFPA and UL certificates for any Special Conditions of Use. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule of the certificate.***

NOTE: ***Review all material and safety information in this manual and install in accordance with this document and all other applicable ATEX, CSA, IECEx, NEC, NFPA and UL standards.***

WARNING: ***Failure to follow appropriate safety procedures or inappropriate use of the equipment described in this manual can lead to injury of personnel or equipment damage.***

WARNING – EXPLOSION HAZARD – ***Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.***

The following symbols are used throughout this manual to alert users to potential hazards or important information. ***Failure to heed the warnings and cautions listed herein can lead to injury and equipment damage.***

Document Label Definitions Used To Indicate Potential Hazards		
Symbol	**Label**	**Description**
	WARNING:	Consists of conditions, practices, or procedures that must be observed to prevent injury or equipment damage.
	CAUTION:	Risk of electric shock or high temperature parts may result in injury if proper precautions are not taken.
	NOTE:	Emphasizes important or essential information.

Locating Information:

NOTE: ***In the interest of completeness, manuals and drawings included with the system may provide information pertaining to options not included with your equipment. Information in application notes supersedes general information in these documents. Information can be located in this manual using any of the following aids.***

1. Table of Contents
2. Getting Help

General Safety and Operating Information:

This section contains general safety and operating information applicable to electrical equipment installed within hazardous locations. This information must be understood by all persons installing, using, or maintaining the electrical equipment. This information is designed to aid personnel in safe installation, operation, and maintenance of any Differential Pressure Gauge Kit offered by Purge Solutions, Inc. It is not designed to replace or limit appropriate safety measures applicable to work performed by personnel. Any additional safety and operating measures that are required must be determined by and followed by personnel performing work on the electrical equipment.

***WARNING:* Deviation from the specified instruction or procedure steps can result in equipment malfunction, equipment damage, or injury to personnel.**

***WARNING:* Return unit to factory for any repairs or replacement of parts, customer not permitted. This will void all warranties and hazardous area certification(s).**

General Precautions:

Protective eyewear ***(glasses with side shields or goggles as appropriate*)** must be worn when servicing any part of electrical equipment. Hot components should be allowed to cool before servicing if possible. Other appropriate equipment or clothing must be used as required by the type of work performed. All applicable regulations and procedures must be followed for the work performed. ***Before*** beginning any work on the equipment, carefully consider all the potential hazards and ensure that appropriate measures are taken to prevent injury to personnel or equipment damage.

***CAUTION:* Electrical equipment components may be hot even when power is not applied. Take appropriate precautions to prevent injury from contact with hot items.**

***CAUTION:* Applicable permits must be obtained and appropriate precautions must be taken to prevent possible injury to personnel or equipment damage when installing or maintaining this equipment.**

Electrical Power:

Appropriate precautions must be taken to prevent sparks that may ignite combustible materials that may be present in the enclosure environment that the Differential Pressure Gauge Kits will be installed. Precautions must also be taken to prevent electrical shock if the enclosure is opened. Power circuit breakers and wiring must be sized properly for the required current. All wiring installations must meet applicable electrical codes.

System Location:

All Purge Solutions, Inc. Purge Differential Pressure Gauge Kits must be installed in a suitable location. All Purge Solutions, Inc. Differential Pressure Gauge Kits must not be installed in an area classification for which it is not rated and must be protected from temperature extremes and potentially high vibration. All Differential Pressure Gauge Kits from Purge Solutions, Inc. should not be mounted in an area with potentially high vibration. All Differential Pressure Gauge Kits from Purge Solutions, Inc. must be attached securely and appropriately at its final installation as instructed in this manual.

Purge Systems:

Electrical equipment may use purging to ensure safe operation when installed within a hazardous location. The protective gas purge supply must be clean, dry, and free from hydrocarbons or corrosive materials. All protective gas purge supply pressures must be set correctly and all electrical equipment enclosure doors must be closed securely. Purged enclosures must not be opened unless power is removed from the electrical equipment or the area is known to be non-hazardous.

CAUTION: ***Electrical equipment enclosures using any Purge Solutions, Inc. purge option must not be opened unless power is removed from the electrical equipment or the area is known not to contain explosive materials.***

Section 2

Specifications

Features
Ingress Protection = NEMA 4X (IP66)
All mounting hardware comes standard
Differential pressure gauge range is 0.0 to 1.0 Inch H2O (2.5 mbar) in 0.1 Inch H20 (0.2 mbar) increments

Normal Operating Conditions	
Dilution Cycle Time To Energizing Electrical Equipment	Typically, dilution cycle time is to ensure that at least five (5) times the volume of free space in the enclosure of protective gas supply is exchanged before power is applied to the electrical equipment. Ten (10) times volumes for motors, generators and other rotating electrical machinery.
Minimum Enclosure Pressure	Purge pressure being maintained above 0.50 inches H_2O (1.25 mbar) in electronics enclosure being monitored.

WARNING: ***The number of exchanged volumes may be higher in some situations*****.**

Utility Requirements	
Minimum Purge Gas Supply Pressure to Purge Gas Inlet Kit Pressure Regulator	20 psig (1.4 Bar) ***(Suggested minimum purge gas supply pressure to compensate for enclosure leak rate)***
Maximum Purge Gas Supply Pressure to Purge Gas Inlet Kit Pressure Regulator	150 psig (10.3 Bar) ***(Certification maximum pressure rating)***
Purge Protective Gas Supply Quality	Water and oil-free, - 40°F (- 40°C) dew point, particles ≤ 5µ, ISA grade hydrocarbon free

Environmental Conditions	
Operating Temperature Range	-20°F to 120°F (6.6°C to 48.9°C)
Used and Mounted	For Indoor and Outdoor Use

Material Specifications
All mounting brackets, tubing and hardware is constructed from 316 Stainless Steel
Differential pressure gauge housing is constructed from glass filled nylon
Differential pressure gauge lens is constructed from polycarbonate

NOTE: ***Purge Solutions, Inc. is NOT responsible for any misuse or improper installation of product, assumes no liability for special or consequential damages caused by use or misuse or improper installation of its products sold and assumes no liability for injury from use or misuse or improper installation of its products or attached products.***

Differential Pressure Gauge Kit Model Number Matrix	
Mounting Location	**Model Number**
Bottom Enclosure Mount	PSO-DPG-B
Left Side Enclosure Mount	PSO-DPG-L
Right Side Enclosure Mount	PSO-DPG-R
Top Enclosure Mount	PSO-DPG-T

Section 3

Introduction

Description:

For purge / pressurization applications that require the internal enclosure purge pressure to be displayed; Purge Solutions, Inc. offers four all stainless steel Differential Pressure Gauge Kit, which can be mounted on the side, top or bottom of an enclosure. Model number PSO-DPG-L is our left side mount version, model number PSO-DPG-R is our right side mount version, model number PSO-DPG-T is our top mount version and model number PSO-DPG-B is our bottom mount version.

WARNING: ***Failure to heed the following information may lead to injury of personnel or equipment damage.***

CAUTION: ***Electrical equipment components may be hot even when power is not applied. Take appropriate precautions to prevent injury from contact with hot items.***

WARNING: ***Failure to allow adequate cooling of electrical equipment components with hot surfaces before opening the purged enclosure can lead to injury of personnel or equipment damage.***

Section 4

Installation

Differential Pressure Gauge Kit Installation Procedure:

Purge Solutions, Inc. all stainless steel Differential Pressure Gauge Kit, which can be mounted on the side, top or bottom of an enclosure. Model number PSO-DPG-L is our left side mount version, model number PSO-DPG-R is our right side mount version, model number PSO-DPG-T is our top mount version and model number PSO-DPG-B is our bottom mount version.

Review all of the material in this manual prior to installing and interfacing Differential Pressure Gauge Kit. If you have any questions, please contact your local Purge Solutions, Inc. representative or the factory (refer Getting Help page 62). Refer to Differential Pressure Gauge Kit, bottom mount, drawing number PSO-DPG-B (page 48), Differential Pressure Gauge Kit, left side mount, drawing number PSO-DPG-L (page 49), Differential Pressure Gauge Kit, right side mount, drawing number PSO-DPG-R (page 50) or Differential Pressure Gauge Kit, top mount, drawing number PSO-DPG-T (page 51) hole sizes and locations required to interface and mount unit to enclosure.

All Differential Pressure Gauge Kits mounting bracket, fittings, tubing and mounting hardware are constructed of 316 stainless steel. Differential pressure gauge housing is constructed of glass filled nylon with a polycarbonate lens. Differential pressure gauge range is 0 to 1.0 Inch H2O (2.5 mbar) in 0.1 inch H2O (0.2 mbar) increments with a working temperature range of 20ºF (6.6ºC) to + 120ºF (+ 48.9ºC)

Step 1:

Make sure that area surrounding the enclosure the Differential Pressure Gauge Kit to be installed is known to be non-hazardous.

Step 2:

Make sure that all power is removed from the electrical equipment located in the enclosure where the Differential Pressure Gauge Kit will be installed.

Step 3:

Choose a mounting location for the Differential Pressure Gauge Kit on the enclosure. The chosen location should permit adequate viewing of the Differential Pressure Gauge Kit pressure gauge and interface for servicing.

Step 4:

Use Mounting Hole Pattern (drawing number PSO-DPG-B, page 10, PSO-DPG-L, page 11, PSO-DPG-R, page 12 or PSO-DPG-T, page 13) to accurately locate the mounting holes. Use the Mounting Hole Template to draw a 1 to 1 scale drawing. Tape the 1 to 1 scale drawing to the ***outside*** of enclosure. The required hole locations can then be transferred and / or marked using the centers of the holes as shown on the 1 to 1 scale drawing.

Step 5:

Drill or punch all holes, per the sizes specified on the Mounting Hole Pattern (drawing number PSO-DPG-B, page 10, PSO-DPG-L, page 11, PSO-DPG-R, page 12 or PSO-DPG-T, page 13).

Step 6:

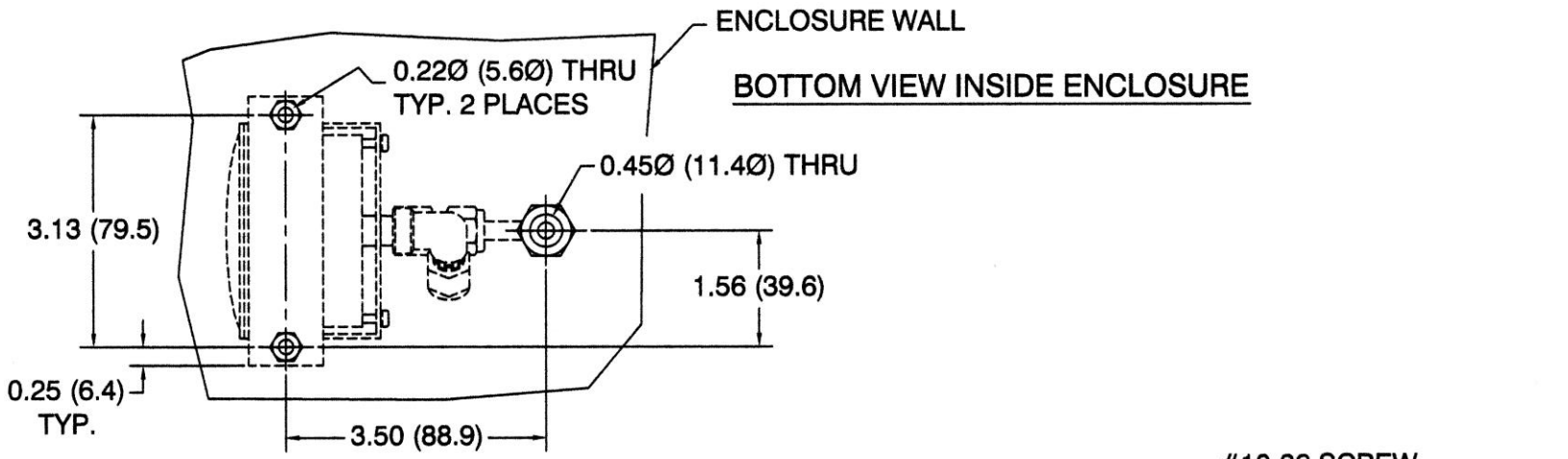
After required mounting holes have been drilled or punched into enclosure, align the Differential Pressure Gauge Kit to the mounting holes fabricated in Step 5.

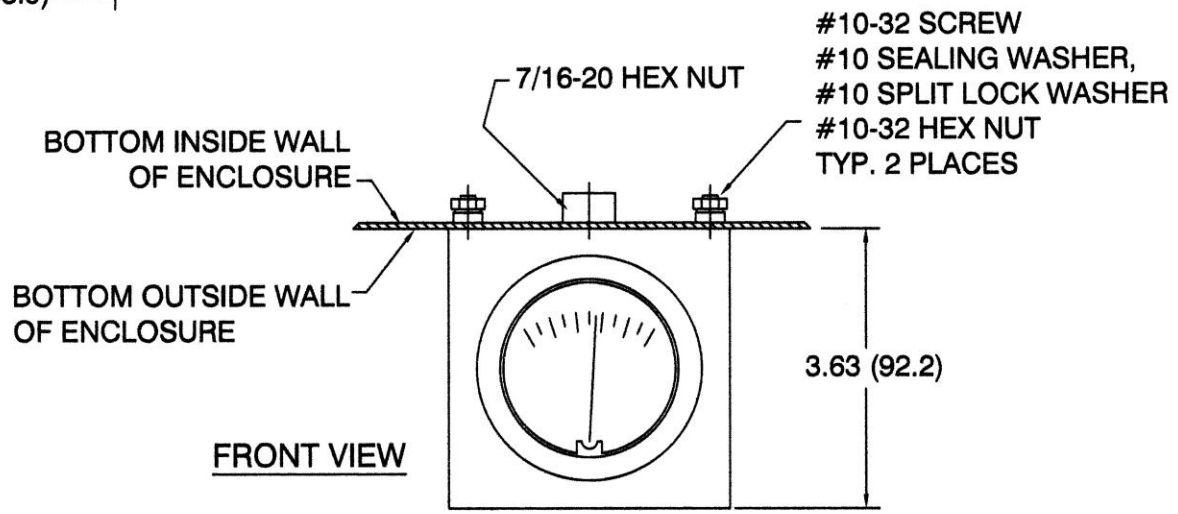
Step 7:

Using the fastening hardware provided with the unit, mount the Differential Pressure Gauge Kit to enclosure. Tighten fastening hardware until all seals are completely compressed against the surface of the enclosure.

Step 8:

After all Differential Pressure Gauge Kit fastening hardware has been properly tightened, the Differential Pressure Gauge Kit is ready to monitor the enclosure internal purge pressure.





REV #	ECO #	CHANGE(S) DESCRIPTION	DATE	CHANGE BY	APPD BY

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DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED-
Dimensions Are In Inches
Dimensions In ( ) Are In mm
Tolerances: .X = ± 0.015 (0.38)
.XX = ± 0.010 (0.25)
.XXX = ± 0.005 (0.13)
Angular = ±0.5°
Break All Sharp Edges
63 Minimum Except As Noted

DRAWN: WJT
DATE: 15/APR/06
CHECKED: WJT
DATE: 15/APR/06
APPROVED: WJT
DATE: 15/APR/06

TITLE: DIFFERENTIAL PRESSURE GAUGE KIT
BOTTOM MOUNTING ASSEMBLY
PART & DWG #: PSO-DPG-B
MATERIAL: NOTED
SHEET 1 OF 1
SCALE: N/A
DWG SIZE A
FINISH: N/A

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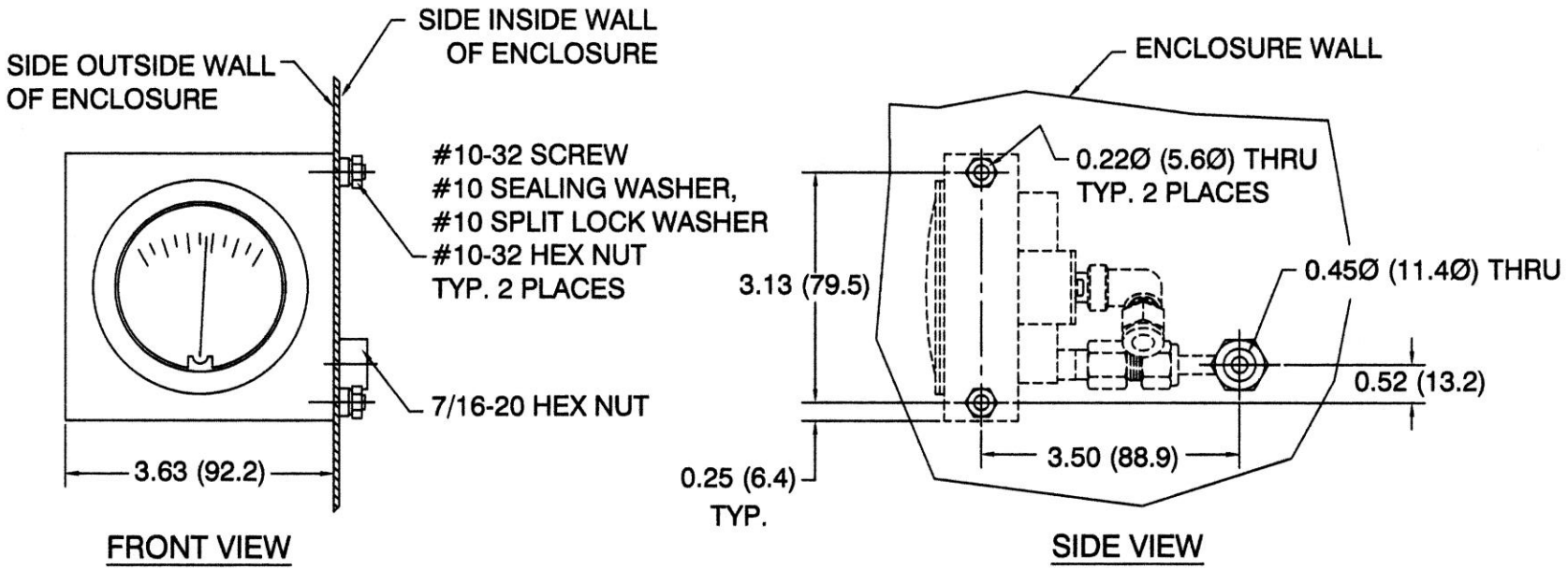

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Angular = ±0.5°
Break All Sharp Edges
63 Minimum Except As Noted

DRAWN: WJT
DATE: 15/APR/06
CHECKED: WJT
DATE: 15/APR/06
APPROVED: WJT
DATE: 15/APR/06

TITLE: DIFFERENTIAL PRESSURE GAUGE KIT
LEFT SIDE MOUNTING ASSEMBLY

PART & DWG #: PSO-DPG-L
MATERIAL: NOTED
SHEET 1 OF 1
SCALE: N/A
DWG SIZE A
FINISH: N/A

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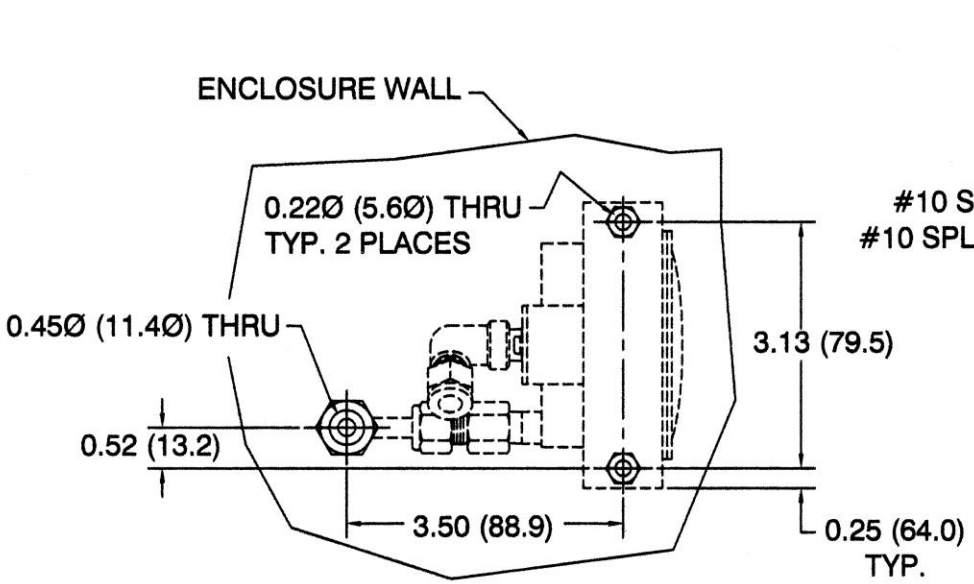
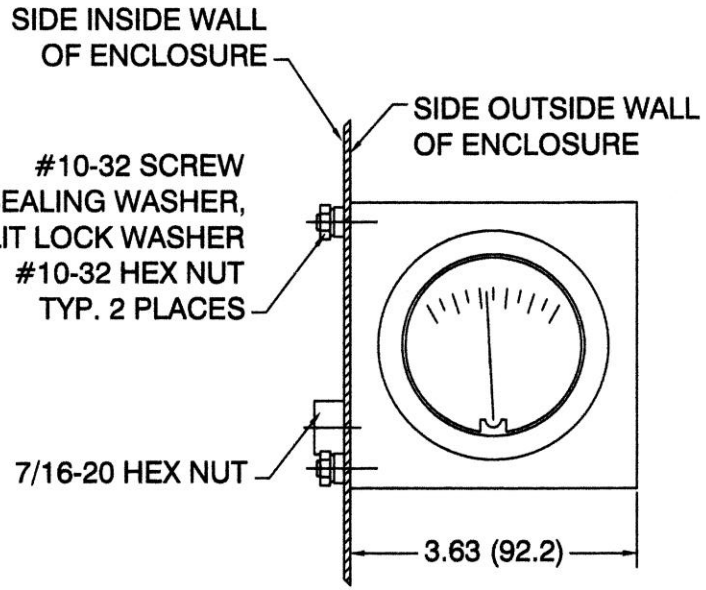


SIDE VIEW



FRONT VIEW

REV #	ECO #	CHANGE(S) DESCRIPTION	DATE	CHANGE BY	APPD BY

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DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED-
Dimensions Are In Inches
Dimensions In ( ) Are In mm
Tolerances: .X = ± 0.015 (0.38)
.XX = ± 0.010 (0.25)
.XXX = ± 0.006 (0.13)
Angular = ±0.5°
Break All Sharp Edges
63 Minimum Except As Noted

DRAWN: WJT
DATE: 15/APR/06
CHECKED: WJT
DATE: 15/APR/06
APPROVED: WJT
DATE: 15/APR/06

TITLE: DIFFERENTIAL PRESSURE GAUGE KIT
RIGHT SIDE MOUNTING ASSEMBLY

PART & DWG #: PSO-DPG-R
MATERIAL: NOTED
SHEET 1 OF 1
SCALE: N/A
DWG SIZE A
FINISH: N/A

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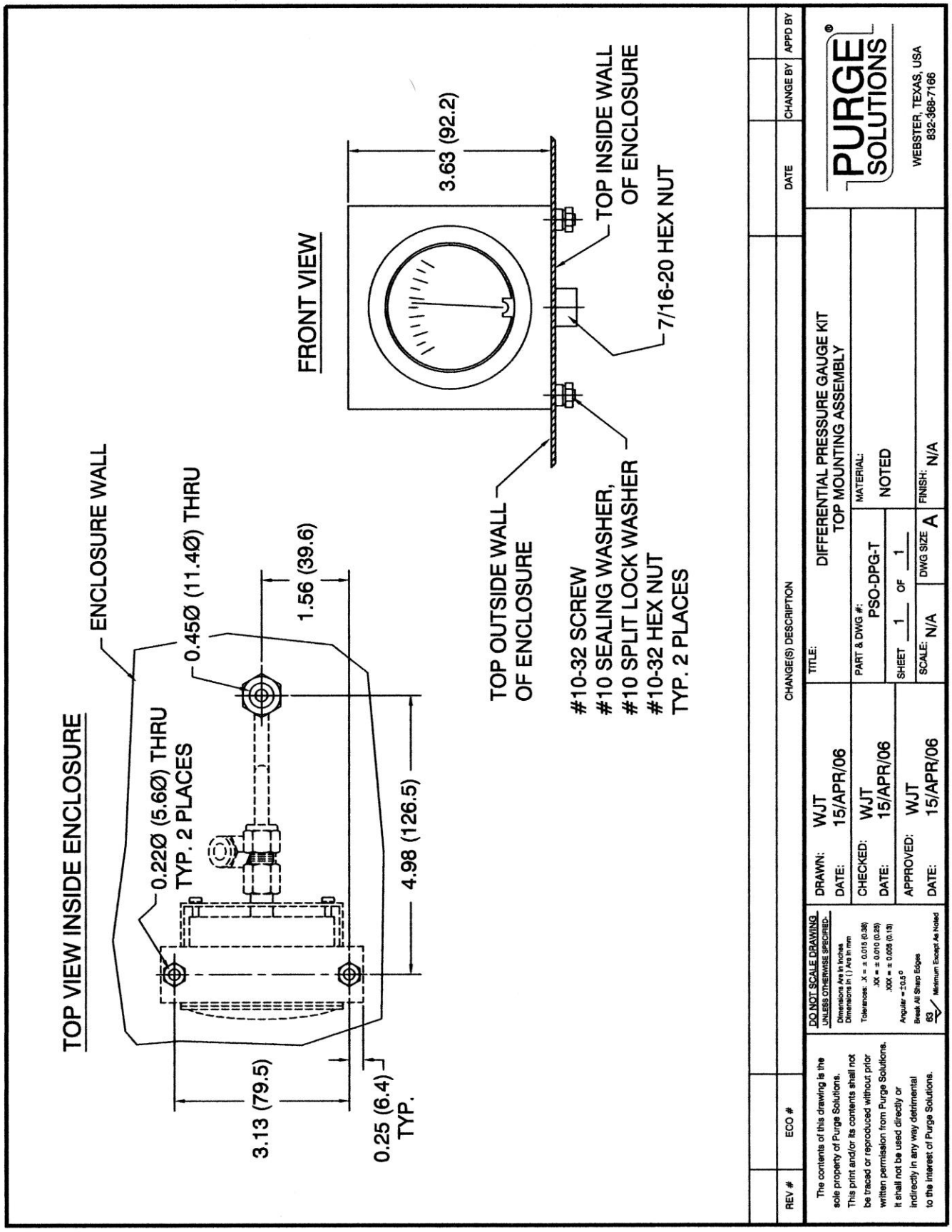
TOP VIEW INSIDE ENCLOSURE
ENCLOSURE WALL
0.22Ø (5.6Ø) THRU
TYP. 2 PLACES
0.45Ø (11.4Ø) THRU
1.56 (39.6)
3.13 (79.5)
4.98 (126.5)
0.25 (6.4)
TYP.
FRONT VIEW
3.63 (92.2)
TOP INSIDE WALL
OF ENCLOSURE
7/16-20 HEX NUT
TOP OUTSIDE WALL
OF ENCLOSURE
#10-32 SCREW
#10 SEALING WASHER,
#10 SPLIT LOCK WASHER
#10-32 HEX NUT
TYP. 2 PLACES
REV #
ECO #
CHANGE(S) DESCRIPTION
DATE
CHANGE BY
APPD BY
DO NOT SCALE DRAWING
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.XX = ± 0.010 (0.25)
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Angular = ±2.0°
Break All Sharp Edges
63 Minimum Except As Noted
DRAWN: WJT
DATE: 15/APR/06
CHECKED: WJT
DATE: 15/APR/06
APPROVED: WJT
DATE: 15/APR/06
TITLE:
DIFFERENTIAL PRESSURE GAUGE KIT
TOP MOUNTING ASSEMBLY
PART & DWG #:
PSO-DPG-T
SHEET 1 OF 1
SCALE: N/A
DWG SIZE A
MATERIAL:
NOTED
FINISH: N/A
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Section 5

Getting Help

Getting Help:

Answers to many questions concerning any optional products we offer are in this manual. If a problem or question is encountered that is not covered in the documentation provided, assistance is available Monday through Friday (except holidays), from 8 a.m. to 5 p.m. United States central time. To obtain assistance by telephone call Purge Solutions, Inc. at **832-368-7166**.

For assistance during times other than normal business hours, consult our World Wide Web Internet site at **http://www.purgesolutions.com**. This site includes equipment information, news releases, videos and other information. E-mail can be sent to **info@purgesolutions.com**.

Purge Solutions, Inc. Standard Terms and Conditions of Sale

The product, equipment, software, material and / or services (collectively the "Product"), which are described in our quotation, purchase order acknowledgment, packing list and / or invoice hereof shall be sold by Purge Solutions, Inc. only upon the following Standard Terms and Conditions of Sale:

1. CONTRACT TERMS AND ACCEPTANCE OF PURCHASE ORDER: These Standard Terms and Conditions of Sale (the "Contract") are the only terms and conditions applicable to the sale of the Products, which are based on qualification and completion of the following: a) Acceptance of any Purchase Order is subject to credit approval by Purge Solutions, Inc. b) Acceptance of completed Purge Solutions, Inc. Customer Information Form. c) Final acceptance of Purchase Order will be Purchase Order Acknowledgment being forwarded to Buyer *(Only until Purchase Order Acknowledgment has been forwarded to Buyer has purchase order been accepted and sent to manufacturing for processing.)*

2. QUOTATION PRICES: Quoted prices are valid for thirty (30) days of quotation date and are exclusive of any applicable taxes, shipping charges and / or any other miscellaneous charges not specified in quote. Prices are subject to change without notice. Any change in quantities, partial release and / or destination may incur a price adjustment.

3. PAYMENT TERMS: Purchase Orders inside the Continental United States; are subject to the approval of Purge Solutions, Inc. Credit Department and unless otherwise agreed in writing, terms of payment are NET thirty (30) days following the date of invoice. Purchase orders outside the continental United States, will be shipped upon receipt of full payment and all costing in US dollars. When the purchase order has been acknowledged, an invoice will be provided. When full payment has been received, including shipping and handling charges, purchase order will be shipped. Purge Solutions, Inc. accepts Visa, MasterCard, Discover and American Express as well as banking transfers. Banking transfer fees are not shared and if banking transfer fees are incorrect; purchase orders will not be shipped. If any Buyer fails to comply with these terms and conditions or sale or if Buyer's credit becomes unsatisfactory to Purge Solutions, Inc., Purge Solutions, Inc. reserves the right to terminate the purchase order without liability to Purge Solutions, Inc. and all future purchase orders of Buyer will be COD or credit card terms before shipping. If a company has an outstanding invoice that is five (5) days past the due date, open purchase orders are subject to being held until such time as the past due status has been brought current.

4. DELIVERY DATES: Quoted delivery dates are approximate estimates determined at the time of quotation and are subject to revisions due to variations in order processing and new purchase orders in manufacturing queue since quoting. Purge Solutions, Inc. assumes no liability for losses arising from inaccurate lead time estimates and is able to make partial shipments against this Contract. The Buyer shall not hold Purge Solutions, Inc. responsible for any delay or damages suffered by the Buyer by reason of any delay due to fires, strikes, riots, Acts of God, priorities, Government orders or restrictions, delays by suppliers or materials or parts, inability to obtain suitable and sufficient labor and / or any other unavoidable contingencies beyond the control of Purge Solutions, Inc. In no case shall Purge Solutions, Inc. be liable for any consequential or special damages arising from any delay in delivery. In the event of such delay, the shipping date shall be extended for a period equal to the time lost by reason of such delay.

5. CANCELLATIONS: Only prior to shipping of Product may Buyer terminate purchase order providing the following: a) Purge Solutions, Inc. is given reasonable notice. b) Purge Solutions, Inc. is compensated for all costs, expenses incurred or committed and for any losses resulting. Once a purchase order has been shipped, all sales are final.

6. CLAIMS, DAMAGE OR LOSS IN TRANSIT: Delivery of Product to carrier from Purge Solutions, Inc. facility or other shipping point shall constitute delivery. Buyer shall bear the risk of loss for damage to or loss of Product from the time Purge Solutions, Inc. delivers Product to carrier, Buyer or Buyer agent. Any claims for damage or loss, which has passed to the Buyer shall be filed with the carrier. Buyer shall give written notice to Purge Solutions, Inc. of any claim for shortage or error in Product shipped within five (5) days of receipt of Product.

7. WARRENTY AND LIMITATION OF LIABILITY: Purge Solutions, Inc. Products are warranted free from defects in material and workmanship at the time of shipment for one year thereafter (One year from date of shipping.). Any claimed defects with Purge Solutions, Inc. Products must be reported within the warranty period and warranty subject to inspection by Purge Solutions, Inc. All warranty inspections are to be performed at Purge Solutions, Inc. facility. Buyer shall ship with shipping charges paid by the Buyer to Purge Solutions, Inc. facility. After inspection by Purge Solutions, Inc. a quotation of proposed work required will be sent to the Buyer. Purge Solutions, Inc. shall be liable only to replace or repair, at its option, free of charge, Products which are found by Purge Solutions, Inc. to be defective in material or workmanship, and which are reported to Purge Solutions, Inc. within the warranty period as provide previously. This right of replacement shall be Buyer's exclusive remedy against Purge Solutions, Inc. Shipment of repaired or replaced products from Purge Solutions, Inc. facility shall be ex-works or FOB Purge Solutions, Inc. facility. Purge Solutions, Inc. shall not be liable for labor charges or other losses or damages of any kind or description, including but not limited to, incidental, special or consequential damages caused by defective Products. This warranty shall be void if product specifications provided by Purge Solutions, Inc. are not followed concerning methods of installation, operation, usage, storage or exposure to harsh conditions (including, but not limited to, temperature and humidity levels outside the approved ranges). Products furnished by Purge Solutions, Inc. by other suppliers shall carry no warranty except that supplier's warranties as to materials and workmanship. Purge Solutions, Inc. disclaims all warranties, expressed or implied, with respect to such Products. The express warranties set forth herein constitute the only warranties with respect to the products sold in connection herewith. Purge Solutions, Inc. makes no representation or warranty of any kind, express or implied (either in fact or by operation of law), with respect to the Products, whether as to their merchantability, fitness for a particular purpose or otherwise. No employee, agent or representative of Purge Solutions, Inc. has any authority to bind Purge Solutions, Inc. to any oral or written representation or warranty concerning the Products over and above that stated herein, except by written amendment signed by Purge Solutions, Inc. and Buyer.

8. RETURNS: Subject to the terms of this Contract regarding CANCELLATION and WARRANTY, All sales are final. Buyer may request a warranty return by contacting Purge Solutions, Inc. and requesting a Return Merchandise Authorization Number. No Product will be accepted for return without a valid Return Merchandise Authorization form and clearly noted on the outside of the shipment. Any return shipment must be made by prepaid freight unless Purge Solutions, Inc. has expressly authorized Buyer in writing to ship such Product to Purge Solutions, Inc. at Purge Solutions, Inc. expense. Any returns of Product authorized by Purge Solutions, Inc. under certain circumstances are subject to a standard restocking charge of 25% of the purchase order's invoice. Non-stock Products are subject to higher restocking charges, if return privileges are extended.

9. SERVICES: Services rendered by Purge Solutions, Inc. whether with or without charge, are only advisory in nature and are only merely incidental to the sales of the Product. When any such services are rendered, Buyer will retain full responsibility for and full control, custody and supervision of the Product, its installation, selection thereof and a representative of Buyer shall be present with full authority to direct operations.